

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

1 1. (~~Original~~Currently amended): A disk array apparatus, comprising:
2 a connector provided for connection with an external power supply to receive
3 power from the external power supply;
4 an internal power supply section for supplying the power received from the
5 connector after AC/DC conversion;
6 a plurality of disk drive cabinets, each connected to the internal power supply
7 section, each including: a first voltage converter for subjecting the power coming from the
8 internal power supply section to DC conversion to derive a different voltage; a disk drive for
9 receiving the power as a result of conversion by the first voltage converter; and a first backup
10 power supply for storing the power provided to the first voltage converter;
11 a communications adapter connected to the internal power supply section for
12 performing data exchange with an external device, including: a second voltage converter for
13 subjecting the power coming from the internal power supply section to DC conversion to derive
14 a different voltage; a plurality of power consumption circuits for receiving the power as a result
15 of conversion by the second voltage converter; and a second backup power supply for storing the
16 power provided to the second voltage converter;
17 a disk adapter connected to the internal power supply section for controlling data
18 writing or reading to/from the disk drive cabinets, including: a third voltage converter for
19 subjecting the power coming from the internal power supply section to DC conversion to derive
20 a different voltage; a plurality of power consumption circuits for receiving the power as a result
21 of conversion by the third voltage converter; and a third backup power supply for storing the
22 power provided to the third voltage converter;
23 a memory section connected to the internal power supply section for storing data
24 and control information to be written or read to/from the communications adapter and the disk

25 adapter, including: a fourth voltage converter to subject the power coming from the internal
26 power supply section to DC conversion to derive a different voltage; a plurality of power
27 consumption circuits for receiving the power as a result of conversion by the fourth voltage
28 converter; and a fourth backup power supply for storing the power provided to the fourth voltage
29 converter; and

30 a mutual power supply line that is connected to the disk drive cabinets, the
31 communications adapter, the disk adapter, and to the memory section, the mutual power supply
32 line is operable so that when the power from the internal power supply section is interrupted, the
33 mutual power supply line can supply backup power to any of the components in need of power
34 using at least one of the first backup power supply provided to each of the disk drive cabinets,
35 the second backup power supply provided to the communications adapter, the third backup
36 power supply provided to the disk adapter, ~~and~~ or the fourth backup power supply provided to
37 the memory section.

1 2. (Original): The disk array apparatus according to claim 1, further
2 comprising a detachable member for an additional backup power supply.

1 3. (Original): The disk array apparatus according to claim 1, wherein in the
2 detachable member, a region for incorporating a backup power supply can be used for
3 incorporating a device to be incorporated into the disk drive cabinet, the communications
4 adapter, the disk adapter, and the memory section.

1 4. (Original): The disk array apparatus according to claim 1, wherein the
2 first backup power supply is detachable from the disk drive cabinet, the second backup power
3 supply is detachable from the communications adapter, the third backup power supply is
4 detachable from the disk adapter, and the fourth backup power supply is detachable from the
5 memory section.

1 5. (Original): The disk array apparatus according to claim 2, wherein power
2 stored in the additional backup power supply is supplied to any of the components in need
3 thereof through the mutual power supply line.

1 6. (Original): The disk array apparatus according to claim 1, wherein when
2 the power from the internal power supply section is interrupted, from the backup power supply
3 corresponding to any of the components that has been stopped in operation responding to
4 completion of a save process executed to save data that has been temporarily stored in the
5 memory section into a disk drive in the disk drive cabinet, the data stored therein is supplied to
6 any of the components in operation through the mutual power supply line.

1 7. (Original): The disk array apparatus according to claim 1, wherein the
2 second and third voltage converters each is a fast-transient-response-type non-isolated DC/DC
3 converter.

1 8. (Original): The disk array apparatus according to claim 1, wherein an
2 output voltage from the internal power supply section is set low enough to be directly supplied
3 through the mutual power supply line to the second and third voltage converters, wherein the
4 second and third voltage converters each is a fast-transient-response-type non-isolated DC/DC
5 converter.

1 9. (Original): The disk array apparatus according to claim 1, wherein the
2 first and fourth voltage converters each is a non-isolated DC/DC converter.

1 10. (Original): The disk array apparatus according to claim 1, wherein the
2 first to fourth backup power supplies each includes a charge/discharge circuit and a secondary
3 battery.

1 11. (Currently amended): A power backup method for a disk array apparatus,
2 comprising:

3 a first step of receiving power from an external power supply through a connector
4 provided for connection therewith;

5 a second step of supplying the power received from the connector in the first step
6 after AC/DC conversion in an internal power supply section;

7 a third step of converting a direct current coming from the internal power supply
8 section as a result of AC/DC conversion in the second step into another direct current having a
9 different voltage by a first voltage converter each provided to a plurality of disk drive cabinets
10 that are connected to the internal power supply section;

11 a fourth step of supplying the power as a result of conversion by the first voltage
12 converter in the third step from the first voltage converter to a disk drive provided to each of the
13 disk drive cabinets;

14 a fifth step of supplying the power as a result of conversion by the first voltage
15 conversion in the third step from the first voltage converter to a first backup power supply for
16 storing the power to be supplied to the first voltage converter each provided to the disk drive
17 cabinets;

18 a sixth step of converting the direct current coming from the internal power
19 supply section in the second step into another direct current having a different voltage by the
20 second voltage converter of a communications adapter for data provision and reception with an
21 external device that is connected to the internal power supply section;

22 a seventh step of supplying the power as a result of conversion by the second
23 voltage converter in the sixth step from the second voltage converter to a plurality of power
24 consumption circuits of the communications adapter;

25 an eighth step of supplying the power as a result of conversion by the second
26 voltage converter in the sixth step from the second voltage converter to a second backup power
27 supply for storing the power to be supplied to the second voltage converter of the
28 communications adapter;

29 a ninth step of converting the direct current coming from the internal power
30 supply section in the second step into another direct current having a different voltage using a

31 third voltage converter of a disk adapter that controls data writing or reading to/from the disk
32 drive cabinets that are connected to the internal power supply section;

33 a tenth step of supplying the power as a result of conversion by the third voltage
34 converter in the ninth step from the third voltage converter to the power consumption circuits of
35 the disk adapter;

36 an eleventh step of supplying the power as a result of conversion by the third
37 voltage converter in the ninth step from the third voltage converter to a third backup power
38 supply for storing the power to be supplied to the third voltage converter of the disk adapter;

39 a twelfth step of converting the direct current coming from the internal power
40 supply section in the second step into another direct current having a different voltage using a
41 fourth voltage converter of a memory section for storing data and control information to be
42 written or read to/from the communications adapter and the disk adapter both connected to the
43 internal power supply section;

44 a thirteenth step of supplying the power as a result of conversion by the fourth
45 voltage converter in the twelfth step from the fourth voltage converter to the power consumption
46 circuits of the memory section;

47 a fourteenth step of supplying the power as a result of conversion by the fourth
48 voltage converter in the twelfth step from the fourth voltage converter to a fourth backup power
49 supply for storing the power to be supplied to the fourth voltage converter of the memory
50 section; and

51 a fifteenth step of supplying power, when the internal power supply section stops
52 in current supply in the second step, through a mutual power supply line that is connected to
53 components of the disk drive cabinets, the communications adapter, the disk adapter, and the
54 memory section, performing power provision to any of the components in need of power using
55 ~~any~~ at least one of the corresponding backup power supplies.

1 12. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein the disk array apparatus further comprises a detachable member
3 for an additional backup power supply.

1 13. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the detachable member of the disk array apparatus, a region for
3 incorporating a backup power supply can be used for incorporating a device to be incorporated
4 into the disk drive cabinet, the communications adapter, the disk adapter, and the memory
5 section.

1 14. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, the first backup power supply is
3 detachable from the disk drive cabinet, the second backup power supply is detachable from the
4 communications adapter, the third backup power supply is detachable from the disk adapter, and
5 the fourth backup power supply is detachable from the memory section.

1 15. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, power stored in the additional backup
3 power supply is supplied to any of the components in need thereof through the mutual power
4 supply line.

1 16. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, when the power from the internal
3 power supply section is interrupted, from the backup power supply corresponding to any of the
4 components that has been stopped in operation responding to completion of a save process
5 executed to save data that has been temporarily stored in the memory section into a disk drive in
6 the disk drive cabinet, the data stored therein is supplied to any of the components in operation
7 through the mutual power supply line.

1 17. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, the second and third voltage
3 converters each is a fast-transient-response-type non-isolated DC/DC converter.

1 18. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, an output voltage from the internal
3 power supply section is set low enough to be directly supplied through the mutual power supply
4 line to the second and third voltage converters, wherein in the disk array apparatus, the second
5 and third voltage converters each is a fast-transient-response-type non-isolated DC/DC
6 converter.

1 19. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, the first and fourth voltage converters
3 are both a non-isolated DC/DC converter.

1 20. (Original): The power backup method of the disk array apparatus
2 according to claim 11, wherein in the disk array apparatus, the first to fourth backup power
3 supplies each include a charge/discharge circuit and a secondary battery.